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Introduction: The Universal Disorder

You know it at once. It may be the fiery sensation of a burn moments after your finger touches the stove. Or it's a dull ache above your brow after a day of stress and tension. Or you may recognize it as a sharp pierce in your back after you lift something heavy.

It is pain. In its most benign form, it warns us that something isn't quite right, that we should take medicine or see a doctor. At its worst, however, pain robs us of our productivity, our well-being, and, for many of us suffering from extended illness, our very lives. Pain is a complex perception that differs enormously among individual patients, even those who appear to have identical injuries or illnesses.

In 1931, the French medical missionary Dr. Albert Schweitzer wrote, "Pain is a more terrible lord of mankind than even death itself." Today, pain has become the universal disorder, a serious and costly public health issue, and a challenge for family, friends, and health care providers who must give support to the individual suffering from the physical as well as the emotional consequences of pain.

A Brief History of Pain

Ancient civilizations recorded on stone tablets accounts of pain and the treatments used: pressure, heat, water, and sun. Early humans related pain to evil, magic, and demons. Relief of pain was the responsibility of sorcerers, shamans, priests, and priestesses, who used herbs, rites, and ceremonies as their treatments.

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The Greeks and Romans were the first to advance a theory of sensation, the idea that the brain and nervous system have a role in producing the perception of pain. But it was not until the Middle Ages and well into the Renaissance—the 1400s and 1500s—that evidence began to accumulate in support of these theories. Leonardo da Vinci and his contemporaries came to believe that the brain was the central organ responsible for sensation. Da Vinci also developed the idea that the spinal cord transmits sensations to the brain.

In the 17th and 18th centuries, the study of the body—and the senses—continued to be a source of wonder for the world's philosophers. In 1664, the French philosopher René Descartes described what to this day is still called a "pain pathway." Descartes illustrated how particles of fire, in contact with the foot, travel to the brain and he compared pain sensation to the ringing of a bell.

In the 19th century, pain came to dwell under a new domain—science—paving the way for advances in pain therapy. Physician-scientists discovered that opium, morphine, codeine, and cocaine could be used to treat pain. These drugs led to the development of aspirin, to this day the most commonly used pain reliever. Before long, anesthesia—both general and regional—was refined and applied during surgery.

"It has no future but itself," wrote the 19th century American poet Emily Dickinson, speaking about pain. As the 21st century unfolds, however, advances in pain research are creating a less grim future than that portrayed in Dickinson's verse, a future that includes a better understanding of pain, along with greatly improved treatments to keep it in check.

The Two Faces of Pain: Acute and Chronic

What is pain? The International Association for the Study of Pain defines it as: *An unpleasant sensory and emotional experience associated with actual or potential tissue damage or described in terms of such damage.*

It is useful to distinguish between two basic types of pain, acute and chronic, and they differ greatly.

- ▶ **Acute pain**, for the most part, results from disease, inflammation, or injury to tissues. This type of pain generally comes on suddenly, for example, after trauma or surgery, and may be accompanied by anxiety or emotional distress. The cause of acute pain can usually be diagnosed and treated, and the pain is self-limiting, that is, it is confined to a given period of time and severity. In some rare instances, it can become chronic.
- ▶ **Chronic pain** is widely believed to represent disease itself. It can be made much worse by environmental and psychological factors. Chronic pain persists over a longer period of time than acute pain and is resistant to most medical treatments. It can—and often does—cause severe problems for patients. A person may have two or more co-existing chronic pain conditions. Such conditions can include chronic fatigue syndrome, endometriosis, fibromyalgia, inflammatory bowel disease, interstitial cystitis, temporomandibular joint dysfunction, and vulvodynia. It is not known whether these disorders share a common cause.

The A to Z of Pain

Hundreds of pain syndromes or disorders make up the spectrum of pain. There are the most benign, fleeting sensations of pain, such as a pin prick. There is the pain of childbirth, the pain of a heart attack, and the pain that sometimes follows amputation of a limb. There is also pain accompanying cancer and the pain that follows severe trauma, such as that associated with head and spinal cord injuries. A sampling of common pain syndromes follows, listed alphabetically.

Arachnoiditis is a condition in which one of the three membranes covering the brain and spinal cord, called the arachnoid membrane, becomes inflamed. A number of causes, including infection or trauma, can result in inflammation of this membrane. Arachnoiditis can produce disabling, progressive, and even permanent pain.

Arthritis. Millions of Americans suffer from arthritic conditions such as osteoarthritis, rheumatoid arthritis, ankylosing spondylitis, and gout. These disorders are characterized by joint pain in the extremities. Many other inflammatory diseases affect the body's soft tissues, including tendonitis and bursitis.

Back pain has become the high price paid by our modern lifestyle and is a startlingly common cause of disability

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for many Americans, including both active and inactive people. Back pain that spreads to the leg is called sciatica and is a very common condition (see below). Another common type of back pain is associated with the discs of the spine, the soft, spongy padding between the vertebrae (bones) that form the spine. Discs protect the spine by absorbing shock, but they tend to degenerate over time and may sometimes rupture.

Spondylolisthesis is a back condition that occurs when one vertebra extends over another, causing pressure on nerves and therefore pain. Also, damage to nerve roots (see [Spine Basics](#) in the Appendix) is a serious condition, called **radiculopathy**, that can be extremely painful. Treatment for a damaged disc includes drugs such as painkillers, muscle relaxants, and steroids; exercise or rest, depending on the patient's condition; adequate support, such as a brace or better mattress and physical therapy. In some cases, surgery may be required to remove the damaged portion of the disc and return it to its previous condition, especially when it is pressing a nerve root. Surgical procedures include discectomy, laminectomy, or spinal fusion (see section on surgery in [How is Pain Treated?](#) for more information on these treatments).

Burn pain can be profound and poses an extreme challenge to the medical community. First-degree burns are the least severe; with third-degree burns, the skin is lost. Depending on the injury, pain accompanying burns can be excruciating, and even after the wound has healed patients may have chronic pain at the burn site.

Central pain syndrome-see "Trauma" below.

Cancer pain can accompany the growth of a tumor, the treatment of cancer, or chronic problems related to cancer's permanent effects on the body. Fortunately, most cancer pain can be treated to help minimize discomfort and stress to the patient.

Headaches affect millions of Americans. The three most common types of chronic headache are migraines, cluster headaches, and tension headaches. Each comes with its own telltale brand of pain.

- ▶ **Migraines** are characterized by throbbing pain and sometimes by other symptoms, such as nausea and visual disturbances. Migraines are more frequent in women than men. Stress can trigger a migraine headache, and migraines can also put the sufferer at risk for stroke.
- ▶ **Cluster** headaches are characterized by excruciating, piercing pain on one side of the head; they occur more frequently in men than women.
- ▶ **Tension headaches** are often described as a tight band around the head.

Head and facial pain can be agonizing, whether it results from dental problems or from disorders such as cranial neuralgia, in which one of the nerves in the face, head, or neck is inflamed. Another condition, **trigeminal neuralgia** (also called tic douloureux), affects the largest of the cranial nerves (see [The Nervous Systems](#) in the Appendix) and is characterized by a stabbing, shooting pain.

Muscle pain can range from an aching muscle, spasm, or strain, to the severe spasticity that accompanies paralysis. Another disabling syndrome is **fibromyalgia**, a disorder characterized by fatigue, stiffness, joint tenderness, and widespread muscle pain. **Polymyositis**, **dermatomyositis**, and **inclusion body myositis** are painful disorders characterized by muscle inflammation. They may be caused by infection or autoimmune dysfunction and are sometimes associated with connective tissue disorders, such as lupus and rheumatoid arthritis.

Myofascial pain syndromes affect sensitive areas known as trigger points, located within the body's muscles. Myofascial pain syndromes are sometimes misdiagnosed and can be debilitating. **Fibromyalgia** is a type of myofascial pain syndrome.

Neuropathic pain is a type of pain that can result from injury to nerves, either in the peripheral or central nervous system (see [The Nervous Systems](#) in the Appendix). Neuropathic pain can occur in any part of the body and is frequently described as a hot, burning sensation, which can be devastating to the affected individual. It can result from diseases that affect nerves (such as diabetes) or from trauma, or, because chemotherapy drugs can affect nerves, it can be a consequence of cancer treatment. Among the many neuropathic pain conditions are **diabetic neuropathy** (which results from nerve damage secondary to vascular problems that occur with diabetes); **reflex sympathetic dystrophy syndrome** (see below), which can follow injury; **phantom limb** and **post-amputation pain** (see [Phantom Pain](#) in the Appendix), which can result from the surgical removal of a limb; **postherpetic neuralgia**, which can occur after an outbreak of shingles; and **central pain syndrome**, which can result from trauma to the brain or spinal cord.